

Dr. Juan C. Meza

University of California, Merced
School of Natural Sciences
5200 North Lake Road
Merced, CA 95343
(209) 201-2794
jcmeza@ucmerced.edu

EDUCATION

Rice University, Ph.D., M.A., Computational and Applied Mathematics, 1986
Rice University, M.S., Electrical Engineering, 1979
Rice University, B.S., Electrical Engineering (cum laude), 1978

SUMMARY OF ADMINISTRATIVE POSITIONS

Dean, School of Natural Sciences, UC Merced, 2011-Present
Division Director (Acting), Computational Research, Lawrence Berkeley National Laboratory, 2010-2011
Department Head, Senior Scientist, High Performance Computing Research, Lawrence Berkeley National Laboratory, 2002-2010
Senior Technical Advisor, DOE National Nuclear Security Agency, 2000
Department Head, Distinguished Member of Technical Staff, Computational Science and Mathematics Research, Sandia National Laboratories, 1987-2002

SUMMARY OF ACADEMIC POSITIONS

Professor, Applied Mathematics, UC Merced 2012-Present
Adjunct Professor, San Diego State University, 2007-2011
Lecturer and Research Associate, Rice University, 1987

ADMINISTRATIVE EXPERIENCE

UNIVERSITY OF CALIFORNIA, MERCED
DEAN, SCHOOL OF NATURAL SCIENCES

2011-PRESENT

UNIVERSITY OF CALIFORNIA, MERCED - POSITION DESCRIPTION

Primary executive officer for the School of Natural Sciences. Responsible for:

- Establishing a vision and strategy for the School
- Recruiting, retaining, and supporting talented faculty
- Enhancing the academic profile and scholarly impact of the School
- Managing the academic enterprise
- Budgeting and financial management
- Advocating for the School of Natural Sciences as a unit, both internally and externally
- Growing the student body thoughtfully and effectively
- Advancing diversity in all academic and administrative areas
- Fund raising and alumni development

Managed annual balanced budgets of over \$21 million, oversaw distribution of \$30M in graduate student support, and supervised staff of 54.

Major Accomplishments

- Hired 29 diverse faculty from 2012-2015, 14 of who were female
- Commissioned a school wide Operational Excellence Review to assess overall processes and improve efficiencies
- Secured funding for campus cost sharing of UCM's first high performance computing cluster

Academic Initiatives

- Worked with the Computational Sciences and Data Analytics faculty group to define the strategic hiring plans for a new cluster hire initiative in this area
- Secured over \$100,000 in funds to improve research infrastructure, including a new greenhouse

Development

- Organized the School of Natural Sciences fundraising efforts for campus wide GivingTuesday, which led to over \$316,000 in gifts and matching funds raised for scholarship support.
- Attended 3 Fundraising Workshops for Academic Leaders and Development Partners through Advancement Resources firm
- Invited to give presentation to UCM Board of Trustees for ideas on raising funds for the CalTeach program and helped to secure a \$100K Science Mathematics Institute/CalTeach endowment.

Entrepreneurial Strategic Initiatives

- Founding member of UC Merced Institute for Research on Innovation, Sustainability, and Entrepreneurship (iRISE), a faculty driven initiative to spearhead development and growth in the San Joaquin Valley to fight poverty and foster prosperity through research.
- Worked with senior leadership to develop and prioritize the requirements for the research labs in the 2020 Project, a \$1B, one million square foot capital expansion project for UC Merced.
- Initiated a public private partnership (\$750K/year) between Sandia National Laboratories and Weidlinger Associates to develop a parallel seismic inverse simulation code.

Governmental Relations/Board Relations

- Served on the National Academies' Board of Mathematical Sciences and its Applications (BMSA) and lead on developing a new study on the "Analytical Research Foundations for the Next-Generation Electric Grid".
- Served on several national boards and federal advisory committees, including the National Science Foundation Mathematical and Physical Sciences Advisory Committee, the National Science Foundation Advisory Committee on Cyberinfrastructure, and the Department of Energy Advanced Scientific Computing Advisory Committee. These federal advisory committees provide advice to the directors of the National Science Foundation and the Under Secretary for DOE.
- Served on the Board of Directors for the Society for the Advancement of Chicanos/Latinos and Native Americans in the Sciences, including Chair of the Nominations Committee and member of the Finance Committee.

Diversity

- PI for an NSF MAPS grant that has provided scholarships to an average of 10 underrepresented minority students in the sciences per year for the last 4 years.
- Initiated and implemented requirement for diversity statement in all faculty hiring leading to the hiring of 4 Latino/Hispanic tenure-track faculty and 14 female faculty.
- Initiated the formation of the first student chapter of SACNAS, which received the Best New Student Chapter Award at the 2015 National Conference.

LAWRENCE BERKELEY NATIONAL LABORATORY, BERKELEY CA

2002-2011

Division Director (Acting), Computational Research

2010-2011

Department Head, Senior Scientist, High Performance Computing Research

2002-2011

Major Accomplishments

- Provided leadership for a division of 272 employees and a budget of \$50M in computational science, mathematical modeling, algorithm design, software implementation, computer system architectures and future technologies, scientific data management, and visualization.
- Point of Contact for DOE/ASCR Scientific Discovery through Advanced Computing (SciDAC) and Base Math and Computer Science Research programs.
- Oversaw the submission of the Computational Research Division's 50+ DOE SciDAC-2 proposals in 2006, which resulted in a 15% increase of funding over previous levels.
- Established collaborations with Environmental Energy Technologies Division, Earth Sciences Division, and Joint Genome Institute.

Governmental Relations/Board Relations

- Institute for Computational and Experimental Research in Mathematics Scientific Advisory Board, 2010-2013
- Institute for Pure and Applied Mathematics Board of Trustees, 2009-2012
- SIAM Board of Trustees, SIAM, 2006-2011
- SIAM Science Policy Committee, 2007-2011

SANDIA NATIONAL LABORATORIES, LIVERMORE CA

1987-2002

Department Head, Distinguished Member of the Technical Staff

Computational Science and Mathematics Research

Major Accomplishments

- Served one-year assignment as a Senior Technical Advisor to the DOE NNSA providing technical expertise to assist the Accelerated Strategic Computing Initiative (ASCI) program concerning high performance computing and applications related services.
- Assisted in the planning and coordinating of the ASCI Applications Program, a \$250M program focused on the development of engineering codes by Sandia National Laboratories and performance and safety codes by the Los Alamos National Laboratory and Lawrence Livermore National Laboratory.
- Provided guidance to the Office of Advanced Simulation and Computing in the development of improved numerical algorithms for incorporation in engineering, performance and safety codes.
- Managed the Computational Sciences and Mathematics Research department from 1998-2000, and the Distributed Computing department from 1997-1998.
- Served as Program Manager for numerous technical programs including: Research Foundation/Network Research, Technology Transfer Initiative on 3D Geophysical Inverse Modeling, ASCI Advanced Simulation Development Environment Problem Solving Environment / Application Development Support, and the DOE 2000 Advanced Computational Toolkit.

ACADEMIC EXPERIENCE

UNIVERSITY OF CALIFORNIA, MERCED

Professor, Applied Mathematics
2012-2016

Courses taught: Mathematical Models for Biology, Foundations of Computational and Applied Mathematics

Major Accomplishments

- New linear programming algorithm for detecting vulnerabilities in the electric power grid
- Development of optimization algorithms for studying antibiotic resistance
- Development of new graduate level course on computational and applied mathematics

LAWRENCE BERKELEY NATIONAL LABORATORY, BERKELEY, CA

Senior Scientist, High Performance Computing Research
2002-2011

Major Accomplishments

- Technical Integration Lead for the Advanced Simulation Capability for Environmental Management program that developed a new high performance computing (HPC) simulation platform for modeling contaminant transport. ASCEM was a five-year, \$12M/year, multi-laboratory multidisciplinary project.
- Lead PI for joint BES/ASCR project (\$5.85M over 5 years) developing scalable methods for studying the electronic excitation and optical responses of nanostructures. This multi-institution project produced over 100 publications and developed several new algorithms for studying nanostructures.
- Development of novel optimization techniques for electronic structure calculations, physics-based preconditioners for accelerating convergence of self-consistent calculations, and the development of a new linear scaling 3D fragment (LS3DF) electronic structure calculation that scales up to 15000 processors.
- LS3DF code was awarded a DOE INCITE award in 2007 for 1.5 Million hours on the Cray XT3 at ORNL, won the SuperComputing 2007 Best Poster Award and the ACM Gordon Bell Prize in 2008.
- Developed parallel methods for simulation-based optimization, including a parallel optimization method for the determination of parameters used in fitting supernova spectral data, a surrogate optimization method used for structure determination problems for nanostructures, and a derivative-free method used for protein folding problems.
- Developed a new mixed integer nonlinear optimization method for detecting vulnerabilities in the electric power grid that is several orders of magnitude faster than previous methods.

SANDIA NATIONAL LABORATORIES, LIVERMORE CA

Department Head, Distinguished Member Technical Staff, Computational Science and Mathematics Research

Major Accomplishments

- Principal investigator for DOE MICS Large Scale Scientific and Engineering Design Optimization project resulting in the open-source object-oriented nonlinear optimization software OPT++.

- Developed object-oriented methods for simulation-based optimization problems for wide-ranging applications including thermal problems in chemical vapor deposition furnaces, molecular conformation problems, and 3D inverse geophysical problems.
- Developed semiconductor device simulation code for modeling of single-event upset phenomenon.

SELECTED GRANTS

- NSF, Network for Computational Nanotechnology NanoBIO node, 2012-2017, \$750,000
- NSF, UC Merced Mathematics and Physical Science Scholars (MAPS), 2011-2016, \$591,113
- DOE, Carbon Capture Simulation Initiative, 2011-2012, \$1,000,000
- DOE, Advanced Subsurface Computing for Environmental Management, 2010-2015, \$10,300,000
- DOE, Optimization and Control of Electric Power Systems, 2009-2011, \$2,022,318
- DOE, Scalable Methods for Electronic Excitation and Optical Responses of Nanostructures: Mathematics to Algorithms to Observables, 2003-2008, \$3,268,457

SELECTED PUBLICATIONS (MORE THAN 20 CITATIONS)

1. *Algorithms and tools for high-throughput geometry-based analysis of crystalline porous material*, T.F. Willems, C.H. Rycroft, M. Kazi, J.C. Meza, M. Haranczyk, *Microporous and Mesoporous Materials*, 149, 1, (2012).
2. *SYNAPPS: Data-Driven Analysis for Supernova Spectroscopy*, Thomas, R.C., Nugent, P.E., & Meza, J.C., *Publications of the Astronomical Society of the Pacific*, 123(900), 237-248. The University of Chicago Press. doi:10.1086/658673. <http://www.jstor.org/doi/abs/10.1086/658673> (2011).
3. *SellInv—An Algorithm for Selected Inversion of a Sparse Symmetric Matrix*, Lin, L., Yang, C., Meza, J. C., Lu, J., Ying, L., and Weinan, E. W., *ACM Trans. Math. Software*. 37, 4, (2011).
4. *Steepest Descent*, Juan C. Meza, *Wiley Interdisciplinary Reviews: Computational Statistics*, 10.1002/wics.117. <http://dx.doi.org/10.1002/wics.117>, (2011).
5. *KSSOLV - a MATLAB Toolbox for Solving the Kohn-Sham Equations*, C. Yang, J.C. Meza, B. Lee, Lin-Wang Wang, *ACM Trans. Math. Software*, Vol. 36, pp. 1-35 (2009).
6. *Optimization Strategies for the Vulnerability Analysis of the Electric Power Grid*, A. Pinar, J. Meza, V. Donde, and B. Lesieutre, *SIAM Journal on Optimization*, Vol. 20, No. 4, pp. 1786-1810 (2010).
7. *A Divide-and-Conquer Linear Scaling Three-Dimensional Fragment Method for Large Scale Electronic Structure Calculations*, Z. Zhao, J. Meza, LW Wang, *J. Phys.: Condens. Matter* 20 294203 (8pp), No. 29 (2008).
8. *Linear-Scaling Three Dimensional Fragment Method for Large-Scale Electronic Structure Calculations*, L.-W. Wang, Z. Zhao, J. Meza, *Phys. Rev. B* 77, 165113 (2008), DOI:10.1103/PhysRevB.77.165113.
9. *Severe Multiple Contingency Screening in Electric Power Systems*, V. Donde, V. Lopez, B. Lesieutre, A. Pinar, C. Yang, J. Meza, *IEEE Transactions on Power Systems*, Vol. 23, No. 2, pp. 406—417, (2008), DOI:10.1109/TPWRS.2008.919243.
10. *OPT++: An Object-Oriented Toolkit for Nonlinear Optimization*, J. Meza, R. Oliva, P. Hough, P. Williams, *ACM Trans. on Math. Software*, Vol. 33, No. 2 (2007).
11. *A Trust Region Direct Constrained Minimization Algorithm for the Kohn-Sham Equation*, Chao Yang, Juan Meza, Lin-Wang Wang, *SIAM J. Sci. Comp.*, 29, No. 5, pp. 1854-1875, DOI: 10.1137/060661442 (2007).
12. *A Constrained Optimization Algorithm for Total Energy Minimization in Electronic Structure Calculation*, C. Yang, J. Meza, L.-W. Wang, *Journal of Computational Physics*, 217, pp 709-721 (2006).
13. *Using Pattern Search Methods for Surface Structure Determination of Nanostructures*, Z. Zhao, J. Meza, M. van Hove, *J. Phys. Condensed Matter*, 18, pp. 8693-8706v (2006).
14. *Identification of Severe Multiple Contingencies in Electric Power Networks*, V. Donde, V. Lopez, B. Lesieutre, A. Pinar, C. Yang, J. Meza, *Proceedings 37th North American Power Symposium* 59-66 (2005).

15. *Can Data Recognize Its Parent Distribution?* A.W. Marshall, J. Meza, I. Olkin, *Journal of Computational and Graphical Statistics*, Vol. 10, No. 3 (2001).
16. *A Multigrid Preconditioner for the Semiconductor Equations*, J.C. Meza and R.S. Tuminaro, *SIAM J. Sci. Comput.*, Vol. 17, No.1, 118-132 (1996).
17. *A Comparison of a Direct Search Method and a Genetic Algorithm for Conformational Searching*, J.C. Meza, R.S. Judson, T.R. Faulkner and A.M. Treasurywala, *J. Comp. Chem.*, Vol. 17, No. 9, 1142-1151 (1996).
18. *Direct Search Methods for the Molecular Conformation Problem*, M.L. Martinez and J.C. Meza, *J.Comp. Chem.*, Vol. 15, 627-632 (1994).
19. *OPT++: An Object-Oriented Class Library for Nonlinear Optimization*, J.C. Meza, Technical Report SAND94-8225, Sandia National Laboratories (1994).
20. *Do Intelligent Configuration Search Techniques Outperform Random Search for Large Molecules?*, R.S. Judson, M.E. Colvin, J.C. Meza, A. Huffer, and D. Gutierrez, *International Journal of Quantum Chemistry*, Vol. 44, 277-290 (1992).

HONORS AND AWARDS

- Rice University Outstanding Engineering Alumni Award, 2013
- Association for Computing Machinery Distinguished Speaker, 2011
- Hispanic Engineer and Information Technology Magazine, Top 200 Influential Hispanics in Technology, 2011
- Fellow, American Association for the Advancement of Science, 2010
- IEEE Computer Society Distinguished Visitor Program, 2010
- Hispanic Business Magazine's 100 Most Influential Leaders, 2009
- Association for Computing Machinery Gordon Bell Prize (special award for algorithm innovation), 2008
- Society for the Advancement of Chicanos and Native Americans in Science Distinguished Scientist, 2008
- Blackwell-Tapia Prize, 2008
- SuperComputing 2007 Best Poster Award, 2007
- Society for Industrial and Applied Mathematics Visiting Lecturer, 2006
- ACM Service Award for Conference Co-Chair of Richard Tapia Celebration of Diversity in Computing Conference, 2003
- Award for Excellence for "Significant Achievement in the Advancement of Distributed Computing Capabilities to Solve Complex Scientific and Engineering Problems", Sandia National Laboratories, 2002
- Sandia National Laboratories Hispanic Leadership Committee Award, 2002
- Sandia National Laboratories Royalty Award, 1996, 1997, 1998
- Sandia Employee Recognition Award, 1995, 1993
- Sandia Award for Excellence, 1993
- Tau Beta Pi Engineering Honor Society, 1978

UNIVERSITY OF CALIFORNIA SERVICE (PARTIAL LIST)

- Search Committee, UC Senior VP for Innovation and Entrepreneurship
- Chair, Search Committee for Dean of Social Sciences, Humanities, and Arts
- Chair, Search Committee for Vice Provost and Dean of Graduate Division
- Vice Chair, UC Mexico Energy Working Group
- UC Office of the President Portfolio Review Group member
- Search Committee for UC Merced Chief Information Officer

PROFESSIONAL SERVICE

- American Association for the Advancement of Science (AAAS) Council Delegate, 2016-2019
- Joint Genome Institute Scientific Advisory Board, 2015-
- NSF Waterman Award Committee, 2012-2014, Chair 2014

- Mathematical Optimization Society, Treasurer, 2010-2016
- SIAM Activity Group on Optimization, Chair, 2014-2016
- AAAS, Mathematics Section Chair, 2013
- National Academies U.S. National Committee for Mathematics, 2011-2014
- National Research Council, Committee on Mathematical Foundations of Validation, Verification, and Uncertainty Quantification, 2010-2012
- DOE SciDAC 2011 Program Committee, 2010-2011
- 7th International Congress on Industrial and Applied Mathematics, Industrial Committee, 2010-2011
- NSF, Division of Mathematical Sciences Committee of Visitors, 2010
- National Academies Panel on Digitization and Communications Science, 2009-2012
- AAAS Electorate Nominating Committee, Mathematics Section, 2007-2010
- Center for Pure and Applied Mathematics, UC Berkeley, 2003-2007
- SIAM Committee on Annual Meeting, 2001-2003
- SIAM Master Program Committee, 2001-2003
- Co-Chair, SIAM Graduate Student Focus on Diversity Day Workshop, 2001, 2002
- Co-Chair, SIAM 10th Conference on Parallel Processing for Scientific Computing, 2001
- Organizing Committee for SIAM Annual Meeting, 2000
- Institute for Mathematics and its Applications Board of Governors, 1999-2001
- National Partnership for Advanced Computational Infrastructure External Visiting Committee, 1999-2002
- Center for Research on Parallel Computation External Advisory Committee 1996-1998
- Editor, Society for Industrial and Applied Mathematics Special Interest Group in Optimization Views and News Newsletter, 1996-2001
- Parallel Tools Consortium Steering Committee, 1995-1997
- Editor, Society for Industrial and Applied Mathematics Special Interest Group in Linear Algebra Electronic Newsletter, 1995-1997
- AMS-SIAM Committee on Applied Mathematics, American Mathematical Society and Society for Industrial and Applied Mathematics 1994-1995
- Board of Trustees, Institute for Mathematical Sciences Education
- California Coalition for Mathematics Committee, 1991-1992
- Committee on Advising, Mathematical Association of America
- Committee on Materials on Careers, Mathematical Association of America

COMMUNITY SERVICE AND AFFILIATIONS

- Merced Symphony Board, 2016-
- University Friends Circle, 2014-Present
- SACNAS Board of Directors, 2012-2015
- Rice Engineering Alumni Member
- Committee on Opportunities in Science, AAAS, 2006-2009
- Castro Valley Youth Soccer League Board, 2002-2003
- MSRI Human Resources Advisory Committee, 2001-2005
- Advisory Board Science in California Communities Informal Science Education, 1995-1997